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US 5566510 A

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(54) Abstract Title
Vehicle window corner sealing and guiding arrangement

(57) A window frame carried on the door of a vehicle is in the form of an aluminium extrusion 20 having a smooth bend 22 in the region where the top of the frame meets the corner between the "B" pillar of the vehicle and the vehicle roof. The window glass (not shown) has a sharp angle matching this corner. The aluminium extrusion 20 carries a flange 26 and is formed with a channel 24 by means of which a window sealing and guiding strip assembly can be secured to the frame. The sealing and guiding strip assembly comprises a moulded part incorporating a separate metal corner piece 80 and defining a window glass receiving channel. This has clips which fit in the channel 24 on the aluminium extrusion. The moulded part is concealed beneath extruded strip parts which have had the flange engaging and window glass receiving portions cut away along line 115 in the corner region. The strips meet at a mitre join 116 at the sharp corner and extend away from the corner piece with the extruded window glass receiving channels matching the channel 100 in the moulded part.

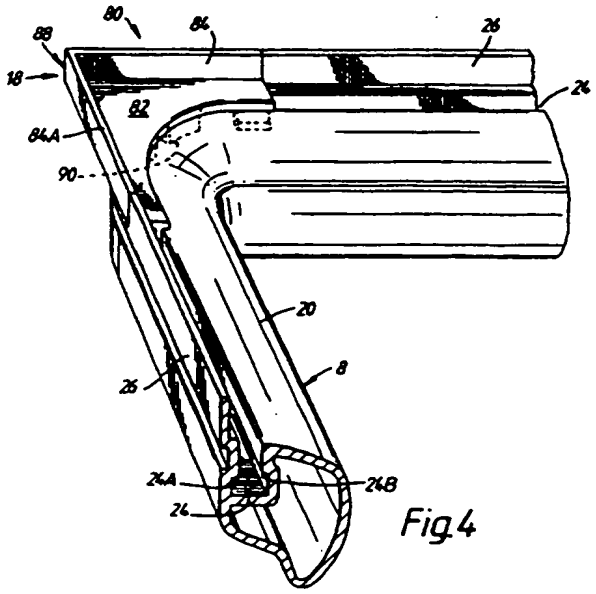

Fig.4

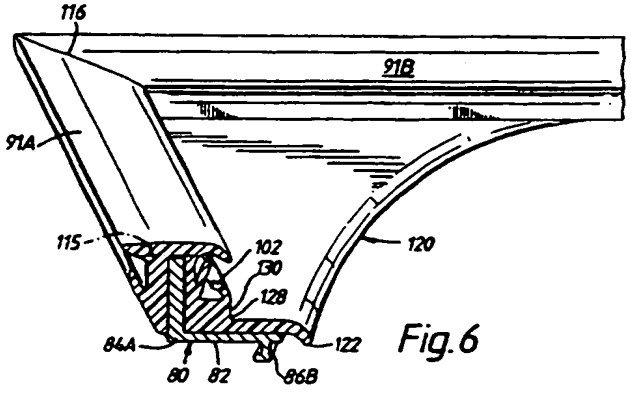

Fig.6

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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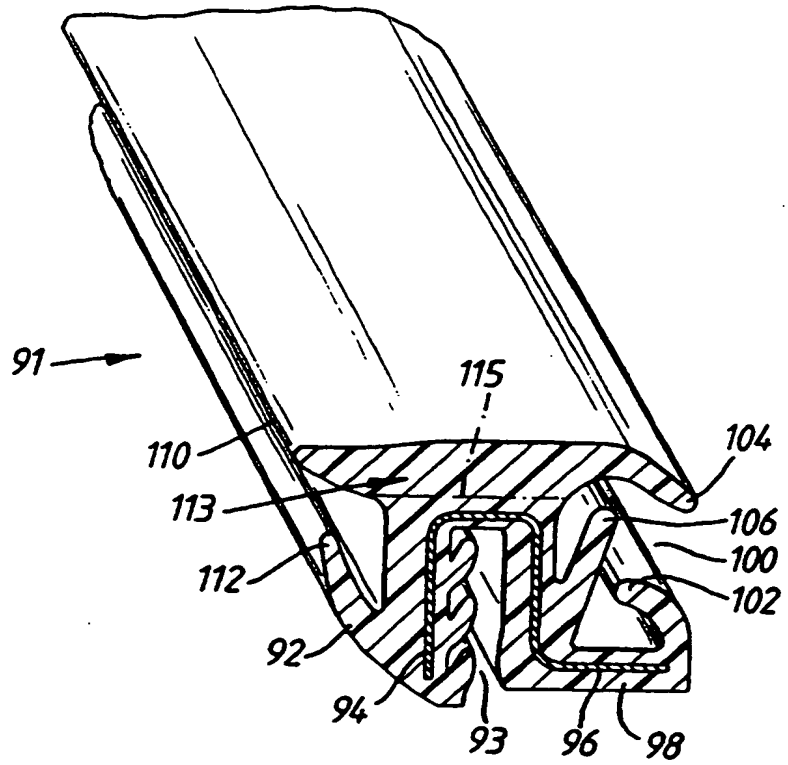

Fig.5

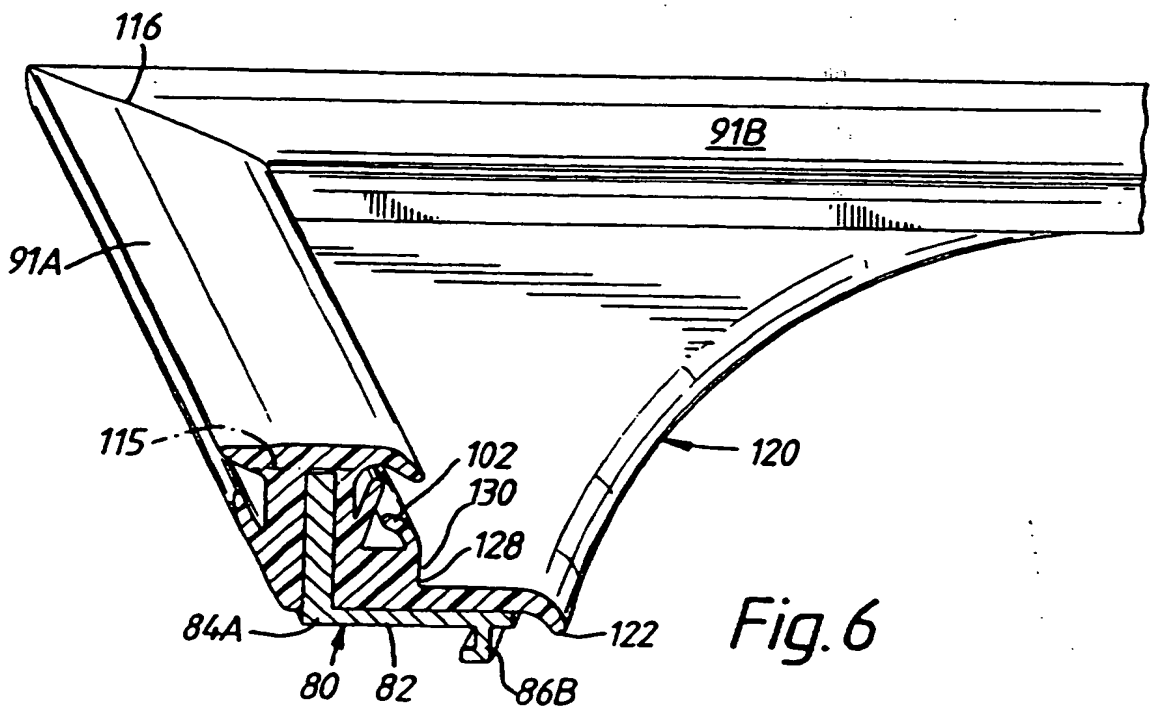

Fig.6

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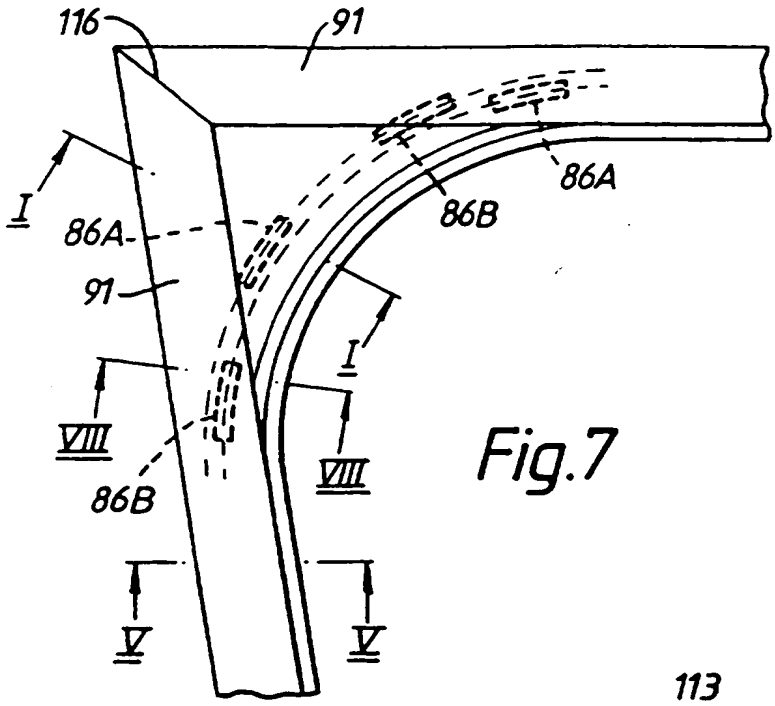

Fig.7

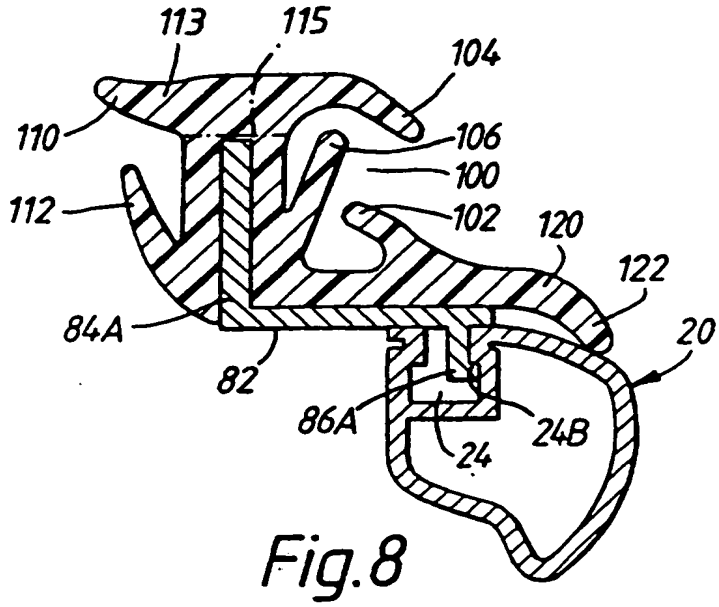

Fig.8

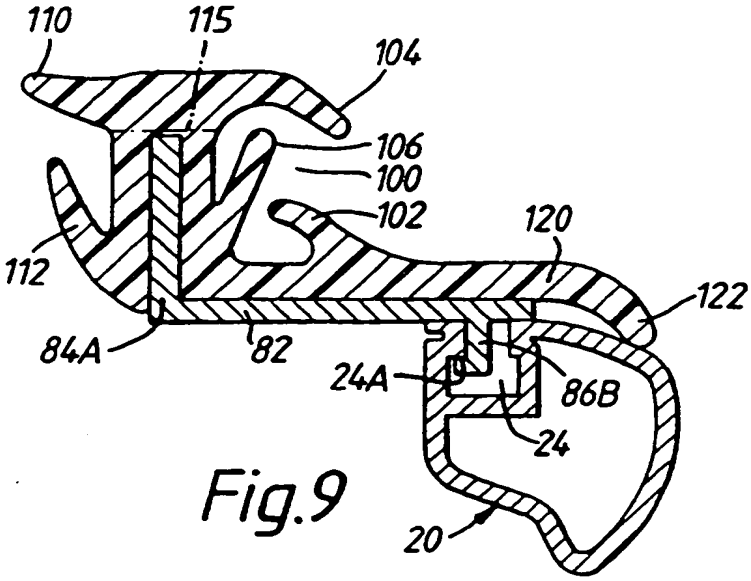

Fig.9

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SEALING OR GUIDING ASSEMBLIES AND METHODS OF MAKING THEM

The invention relates to sealing or guiding assemblies and methods of making them. Embodiments of the invention, to be described in more detail below, are window sealing and guiding strip assemblies for use in motor vehicle body construction and, in particular, for use in window frames forming the upper part of vehicle doors, the sealing or guiding strip assembly being attached to the window frame and supporting the edge of a window pane which can be raised from and lowered into the lower part of the door. However, the invention is not restricted to such applications.

According to the invention, there is provided a sealing or guiding assembly for sealing or guiding a sharp corner of a window pane, comprising flexible material for contacting the window pane, the flexible material being arranged to define the sharp corner, and including a stiff corner piece attached to the flexible material in the region of the sharp corner for supporting it there, the flexible material in the region of the sharp corner being at least partly of moulded form and the stiff corner piece being incorporated into the flexible material during

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the moulding of the said part.

According to the invention, there is further provided a method of constructing a window frame assembly carried by the upper part of a door in a vehicle body the window pane of which defines two edges having directions meeting at a sharp angle, comprising the steps of: forming a relatively rigid window frame for the window opening, the window frame defining a smooth curve in the region of the frame corresponding to the sharp angle in the window pane; forming a rigid corner piece having an outer profile matching the sharp angle of the corner, a curved inner profile bridging across the sharp corner, and locking means for locking the corner piece in the window frame; incorporating the rigid corner piece in a moulded part of flexible material which defines two window-glass receiving channels meeting at the said sharp angle and sized to receive the edges of the window glass which meet at the sharp angle; locking the corner piece, after incorporation into the moulded part, in the window frame; the rigid corner piece being shaped to have an outside profile matching the sharp angle and also defining a curved region bridgingly extending across the sharp angle and matching the said curve in the frame; moulding the moulded part of flexible material to overlay the curved region of the corner piece; extruding lengths of channel-shaped

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strip of flexible material; and attaching them to the moulded part to lead in the respective said directions away from the sharp angle so that their channels are aligned with the glass-receiving channels of the moulded part.

A window sealing and guiding strip assembly embodying the invention, and a method according to the invention of making it, will now be described, by way of example only, with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a side view of a motor vehicle body;

Figure 2 is a diagrammatic perspective view of part of the window frame shown circle at II in Figure 1 but omitting the window sealing and guiding strip assembly;

Figure 3 is a perspective view of a corner support for the sealing and guiding strip assembly;

Figure 4 is a perspective view of the frame of Figure 2 but also showing the corner support of Figure 3 in position thereon;

Figure 5 is a perspective sectional view of a sealing and guiding

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strip used in the assembly;

Figure 6 is a perspective cross-sectional view of the assembly at the corner;

Figure 7 is a diagrammatic plan view of the assembly at the corner;

Figure 8 is a section on the line VIII-VIII of Figure 7; and

Figure 9 is a section on the line IX-IX of Figure 7.

Figure 1 shows the side of a motor vehicle body having a door 5 with a lower part 6 carrying a window frame indicated diagrammatically at 8 for a window opening 10. In the usual way, a window glass for the opening 10 can be raised from and lowered into the lower part 6 of the door. The frame 8 carries the sealing and guiding strip (not visible in Figure 1) which will be described in more detail below.

The frame 8 comprises a part 8A along the sloping front of the door which is alongside the so-called "A" pillar of the vehicle body, a generally vertical part 8B alongside the so-called "B"

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pillar 12 of the vehicle body, and a part 8C running along the top of the door.

Where the "B" pillar 12 meets the roof 14 of the vehicle, a sharp angle (substantially 90°) is formed, at 16. In a manner to be explained below, the sealing and guiding strip assembly to be described combines with the frame 8 to form a corresponding sharp angel 18 of the frame for receiving the matching angle of the window glass.

The frame 8 carried by the door is (in this example) made of metal, such as extruded aluminium. Figure 2 shows part of the frame 8 at the corner 18 and is an enlarged view of the region II of Figure 1. The sealing and guiding strip assembly is omitted from Figure 2. As indicated in Figure 2, the frame is made of a hollow aluminium extrusion 20 which has a curved portion 22 at the position where the sharp corner 18 will be formed in a manner to be described. As shown in Figure 1, therefore, this curved portion 22 bridges across the position where the sharp corner is to be formed.

Facing outwardly of the vehicle, the aluminium extrusion 20 defines a channel 24 and an outwardly protruding flange 26.

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However, it will be noted that the flange 26 is interrupted (that is, omitted) over the curved region 22 of the extrusion, so as to form a gap 28. Channel 24 is formed with a narrowed mouth defining shoulders 24A and 24B.

Figure 3 shows a corner support 80 which is separately constructed from metal such as aluminium and, in a manner to be explained, is shaped and sized to fit the gap 28 (Fig. 2) to define the sharp corner 18. The corner support 80 is of simple construction comprising a platform 82 which, on its outside, integrally carries flanges 84A and 84B of the same general thickness as the flange 26 on the aluminium extrusion 20 (see Fig. 2) and, on its other side, integrally carries a series of clips 86A and 86B. Clips 86A have hook parts 87A facing outwardly of the sharp corner 18. Clips 86B have hook parts 87B facing inwardly thereof. The corner support 80 is shaped to provide an outside edge 88 which matches the angle of the corner 18. Its opposite edge 90 is curved to match the outside radius of the curved portion 22 (see Fig. 2) of the aluminium extrusion 20.

Figure 4 shows how the corner piece 80 fits in position on the aluminium extrusion 20. The clips 86A and 86B (Fig. 3) of the corner piece 80 are slotted into the channel 24 over the curved

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region 28 of the aluminium extrusion 20 (Fig. 2). In a manner to be described in more detail, the hook parts 87A of the clips 86A engage under the shoulder 24A while the hook parts 87B of the clips 86B engage under the shoulder 24B. The flange 84 of the corner piece 80 is thus aligned with the flange 26 of the aluminium extrusion; together, they form a continuous flange having a sharp angle 18 (substantially 90°) matching the angle shown at 16 in Figure 1. In the manner to be explained, this continuous flange, made up of the separate flanges 26 and 82, supports the sealing strip. However, as will also be explained, the corner piece 80 is not in fact fitted in position on the extrusion 20 on its own but only after incorporation into the sealing strip.

Figure 5 shows one form which the sealing strip 91 can take, along those portions of its length which are supported by the flanges 26; the sealing strip has a different construction where it is supported by the flanges 84A and 84B of the corner piece 80.

As indicated, it comprises extruded material 92, such as plastics or rubber material, which defines a channel 93 and incorporates a channel-shaped metal carrier 94. The carrier 94

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may take any suitable form. It may be in the form of a continuous unapertured metal channel. Instead, it may be apertured to increase its flexibility. In another form, it comprises a series of side-by-side generally U-shaped metal elements defining the channel and either entirely disconnected from each other or connected such as by short integral flexible connecting links. In a further form, the carrier comprises looped wire. Other possible forms of carrier may be used, though. As shown, the carrier 94 has an integral extension 96 which extends at right angles to the channel 93.

The carrier extension 96 reinforces a wall 98 of a window glass receiving channel 100. The wall 98 is integral with a re-entrant lip 102, and the opposite wall of the glass-receiving channel 100 is formed by a lip 104. A further lip 106 is mounted on the base of the channel 100.

In use, two lengths of the sealing strip 91 are mounted in position on the two flanges leading towards the corner 18 (Figures 2 and 4) by positioning the strip so that the flanges 26 engage in the channel 93. The strip 91 firmly grips the respective flange, the gripping force being assisted by the resilience of the metal carrier 94 and also by the provision of

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integral flexible lips 108 which extend inwardly of the channel 93. The lips 108 may be extruded so as to be of softer material than the remainder of the extruded material 90, to increase their frictional grip.

In this way, the strips 91 present their glass-receiving channels 100 in the plane of the window opening so that the sliding window glass enters the channel 100. The outwardly facing surfaces of the lips 102 and 106 are coated with flock where they meet the window glass.

As shown in Figure 5, the sealing strip 91 includes further lips 110 and 112 on the outside of the window frame, that is, on the outside edge of the door. These lips 110 and 112 engage the frame of the door opening when the door is closed, to provide a seal around the edge of the door.

At the corner of the window frame, the sealing strip has a modified construction and this will be described with reference to Figure 6. As shown in Figure 6, the upper part of the sealing strip, that is, the part 113 (see also Figure 5) above a notional plane 115, has the same form as in Figure 5; two lengths of this part 113 are mitre-cut and then joined together along the line

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116 (Fig. 6). However, the remainder of the sealing strip at the corner, that is, the part below the notional plane 115, is of slightly different form. This lower part is produced by a moulding operation so that its cross-section has the same general shape as the lower part of the sealing strip 91 of Figure 5 and corresponding parts are correspondingly referenced. However, as shown in Figure 6, the moulding operation also produces a generally triangular-shaped flexible flap portion 120 integrally joined to and extending from the wall 98 (see Figure 5) of the glass-receiving channel 100. In addition, the moulding operation is arranged to incorporate the corner piece 80 of Figure 3 into the sealing strip so that it is covered by the moulded flap portion 120.

The manufacturing process involves the production of lengths of sealing strip 91 of the form shown in Figure 5, such lengths being produced advantageously by extrusion. Separately, the moulding operation described above with reference to Figure 6 is carried out. The extrusion process produces strips 91 with their upper parts 113 integrally connected to the remainder of the extruded material 92. The carrier 94 may be incorporated by a cross-head extruder technique. However, the moulding operation described above with reference to Figure 6 only produces the form

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shown in Figure 6 below the notional plane 115 (and incorporating the corner piece 80).

During the assembly process, two sealing strips (of Figure 5) are taken and are each cut through along the notional plane 115 for a length corresponding to the length of one of the flanges 84A,84B of the corner piece 80.

The lower part of each such length (the part below the notional plane 115 in Figure 5) is discarded. The upper parts 113 of the two strips are joined together with a mitre join at 116 and are also welded or glued on to the upper surface of the moulded part. The assembled sealing strip is then fitted onto the window frame shown in Figure 2 by engaging the flanges 26 in the channels 93 of the two lengths 91 of sealing strip and by engaging the clips 86A and 86B (Figure 3) of the corner piece 80 (which now carries the moulded part) into the channel 24. The extruded top parts 113 completely cover the moulded part and thus conceal the joins between it and the two lengths of sealing strip and also ensure that any slightly different colour which the moulded part may have is not externally visible.

Figure 7 is a diagrammatic plan view of the assembled sealing

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strip at the corner 18. The clips 86A and 86B are shown in bold form in Figure 7. Figures 8 and 9 show sections on the lines VIII-VIII and IX-IX of Figure 7 and illustrate how the hooks 87A and 87B hold the corner piece 80 in position.

The corner piece 120 is formed with a curved-over lip 122 which contacts the surface of the aluminium extrusion 20 (Figures 7 and 8).

CLAIMS

1. A sealing or guiding assembly for sealing or guiding a sharp corner of a window pane, comprising flexible material for contacting the window pane, the flexible material being arranged to define the sharp corner, and including a stiff corner piece attached to the flexible material in the region of the sharp corner for supporting it there, the flexible material in the region of the sharp corner being at least partly of moulded form and the stiff corner piece being incorporated into the flexible material during the moulding of the said part.

2. An assembly according to claim 1, in which the moulded part is at least partly concealed by two strip parts laid over it and meeting at the sharp corner.

3. An assembly according to claim 1 or 2, in which the corner piece has an outer profile matching the sharp angle of the corner, and a curved inner profile bridging across the sharp corner.

4. An assembly according to claim 3, in which the moulded part includes a moulded flap portion of the flexible material overlaying the corner piece.

5. An assembly according to any preceding claim, in which the stiff corner piece clippingly engages a frame for the window.

6. A sealing and guiding strip assembly for a window opening which has a window pane defining a sharp corner of predetermined angle and a relatively rigid frame defining a smooth curve at and bridging across the sharp corner, the sealing strip comprising flexible material defining two channels meeting at the sharp corner and sized to receive the edges of the window glass meeting there, and a rigid support member secured to the flexible material at the sharp corner for supporting it there and having a profile which, on the outside of the sharp corner, matches the profile there and, on the inside thereof, is curved to bridge across the sharp corner and to match the smooth curve, the flexible material being partly of moulded form at the sharp corner and the rigid support member being incorporated into the moulded part during the moulding thereof.

7. An assembly according to claim 6, in which the support member includes means for lockably mounting it on the frame.

8. An assembly according to claim 7, in which the support member defines rigid projection means running along its said

curved profile and sized to fit lockingly into a corresponding channel in the curve of the frame.

9. An assembly according to any one of claims 6 to 8, in which the flexible material includes means for mounting it on the frame at regions spaced from the sharp corner.

10. An assembly according to claim 9, in which the flexible material defines a slot extending longitudinally along its length for embracingly gripping an edge or flange on the frame at the regions spaced from the sharp corner.

11. An assembly according to claim 10, in which the support member defines an edge or flange which is embracingly gripped by the moulded part of the flexible material.

12. An assembly according to claim 11, in which the edge or flange of the support member is aligned with the edge or flange on the frame when the assembly is mounted on the frame.

13. An assembly according to any one of claims 6 to 12, in which the moulded part of the flexible material is at least partly concealed by two extruded strip parts of the flexible material

laid over and secured to the moulded part and meeting at the sharp corner.

14. An assembly according to claim 13, in which the moulded part includes a moulded flap portion of the flexible material overlaying the rigid support member.

15. A method of constructing a window frame assembly carried by the upper part of a door in a vehicle body the window pane of which defines two edges having directions meeting at a sharp angle, comprising the steps of: forming a relatively rigid window frame for the window opening, the window frame defining a smooth curve in the region of the frame corresponding to the sharp angle in the window pane; forming a rigid corner piece having an outer profile matching the sharp angle of the corner, a curved inner profile bridging across the sharp corner, and locking means for locking the corner piece in the window frame; incorporating the rigid corner piece in a moulded part of flexible material which defines two window-glass receiving channels meeting at the said sharp angle and sized to receive the edges of the window glass which meet at the sharp angle; locking the corner piece, after incorporation into the moulded part, in the window frame; the rigid corner piece being shaped to have an outside profile

matching the sharp angle and also defining a curved region bridgingly extending across the sharp angle and matching the said curve in the frame; moulding the moulded part of flexible material to overlay the curved region of the corner piece; extruding lengths of channel-shaped strip of flexible material; and attaching them to the moulded part to lead in the respective said directions away from the sharp angle so that their channels are aligned with the glass-receiving channels of the moulded part.

16. A method according to claim 15, in which part, only, of the extruded lengths of channel-shaped strip are extended to cover and partially conceal the moulded part and to meet at the sharp corner.

17. A sealing and guiding strip assembly for a window frame, substantially as described with reference to the accompanying drawings.

18. A method of fitting a sealing and guiding strip assembly to a window frame, substantially as described with reference to the accompanying drawings.

The Patent Office

18.

Application No: GB 9700935.1 **Examiner:** Paul Foot
Claims searched: 1-18 **Date of search:** 11 February 1998

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E06B: 7/22, 7/23

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Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	GB2285471A	(DRAFTEX INDUSTRIES LIMITED)	
A	GB2273951A	(DRAFTEX INDUSTRIES LIMITED)	
A	EP0605092A1	(DRAFTEX INDUSTRIES LIMITED)	
A	US5566510A	(HOLLINGSHEAD ET AL)	

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